

HCT CO., LTD.

CERTIFICATE OF COMPLIANCE
FCC Class II Permissive Change

Applicant Name: LG Electronics MobileComm U.S.A., Inc.	Date of Issue: March 06, 2013
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632	Test Site/Location: HCT CO., LTD., 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, Korea
	Report No.: HCTR1303FR10
	HCT FRN: 0005866421

FCC ID : ZNFUS780

APPLICANT : LG Electronics MobileComm U.S.A., Inc.

FCC Model(s): US780
Additional FCC Model(s): LG-US780, LGUS780, AS780, LGAS780, LG-AS780
EUT Type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC

Frequency Range: 2412 MHz - 2462 MHz (2.4 GHz Band)
5745 MHz - 5825 MHz (5.8 GHz Band)_20 MHz BW,
5755 MHz - 5795 MHz (5.8 GHz Band)_40 MHz BW

Modulation type: CCK/DSSS/OFDM

FCC Classification: Digital Transmission System(DTS)

FCC Rule Part(s): Part 15.247

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)



Report prepared by
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Test engineer of RF Team



Approved by
: Chang Seok Choi
Manager of RF Team

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCTR1303FR10	March 06, 2013	- First Approval Report

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1. GENERAL INFORMATION

Applicant: LG Electronics MobileComm U.S.A., Inc.
Address: 1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID: ZNFUS780
EUT Type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC
Model name(s): US780
Additional Model name(s): LG-US780, LGUS780, AS780, LGAS780, LG-AS780
Date(s) of Tests: January 11, 2013 ~ January 29, 2013
Place of Tests: HCT Co., Ltd.
 105-1, Jangam-ri , Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, KOREA.
 (IC Recognition No. : 5944A-3)

2. EUT DESCRIPTION

EUT Type	AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC
FCC Model Name	US780
Additional FCC Model Name	LG-US780, LGUS780, AS780, LGAS780, LG-AS780
Power Supply	DC 3.8 V
Battery type	Li-ion Battery(Standard)
Frequency Range	TX: 2412 MHz~2462 MHz, 5745 MHz~5825 MHz_20 MHz, 5755 MHz~5795 MHz_40 MHz RX: 2412 MHz~2462 MHz, 5745 MHz~5825 MHz_20 MHz, 5755 MHz~5795 MHz_40 MHz
Modulation Type	DSSS/CCK(802.11b), OFDM(802.11a, 802.11g, 802.11n_20 MHz BW, 802.11n_40 MHz BW)
Antenna Specification	Manufacturer: LS Mtron Ltd. Antenna type: Internal Antenna Peak Gain : 0.1 dBi (2.4 GHz Band), -4.88 dBi (5.8 GHz Band)

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3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Testing Unlicensed Wireless Devices(ANSI C63.10-2009) Operating Under §15.247” were used in the measurement.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2009) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.3 of ANSI C63.10. (Version: 2009).

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

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4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 105-1, Jangam-ri, Majang-Myeon, Icheon-si, Kyunggi-Do, 467-811, Korea. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated March 02, 2011 (Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

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6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203

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7. SUMMARY TEST OF RESULTS

Test Description	FCC Part Section(s)	Test Limit	Test Condition	Test Result
Radiated Spurious Emissions	§15.205, 15.209	cf. Section 8.5.1	RADIATED	PASS
Radiated Restricted Band Edge	§15.247(d), 15.205, 15.209	cf. Section 8.5.2		PASS



8. TEST RESULT

8.1 RADIATED MEASUREMENT.

8.1.1 RADIATED SPURIOUS EMISSIONS.

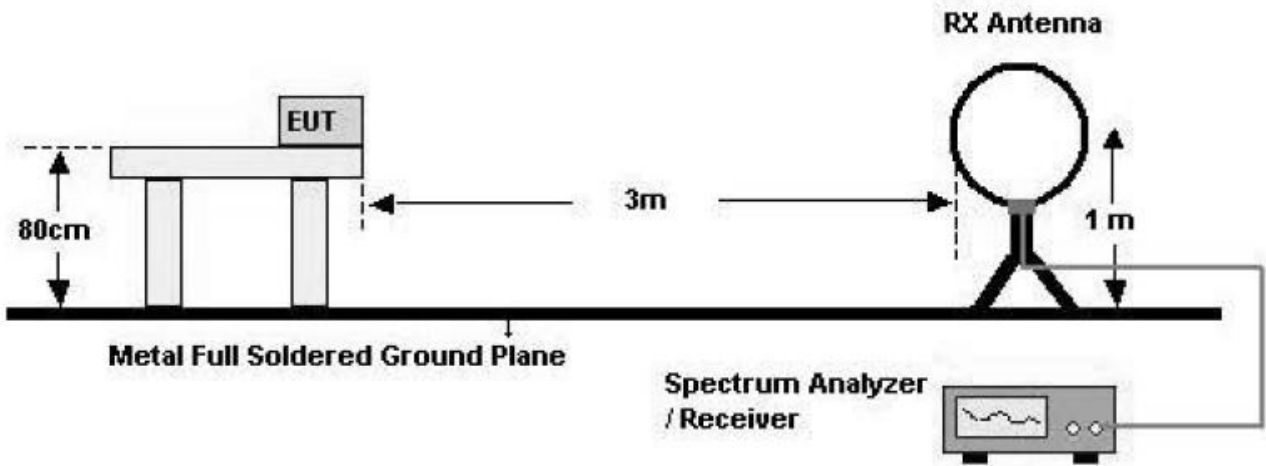
Test Requirements and limit, §15.205, §15.209

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

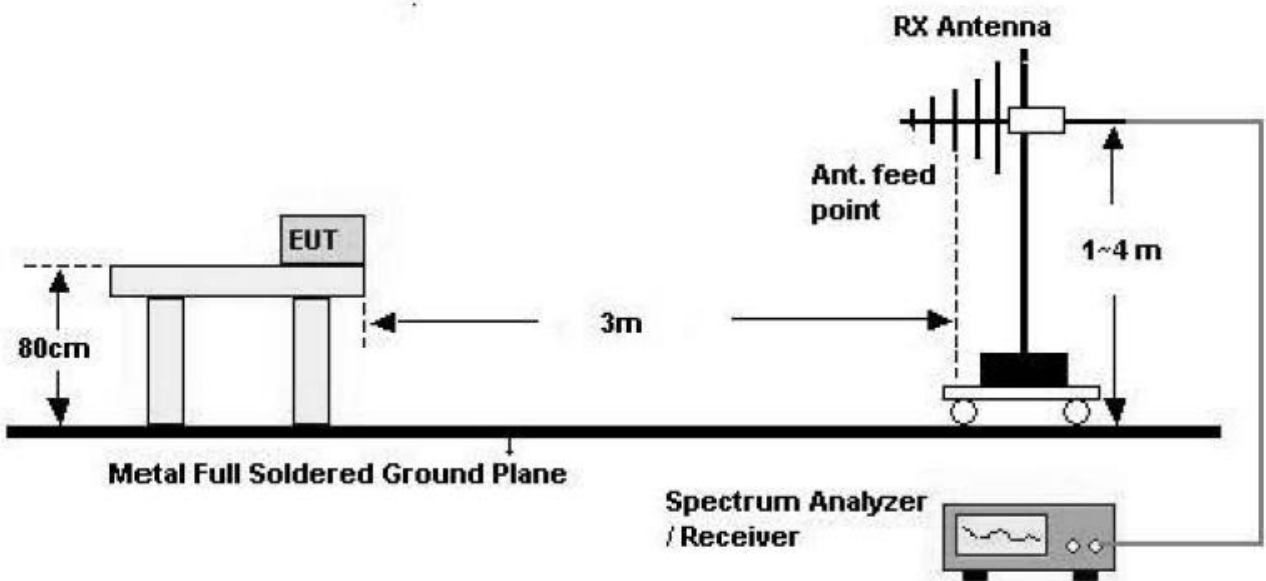
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Test Configuration

Below 30 MHz

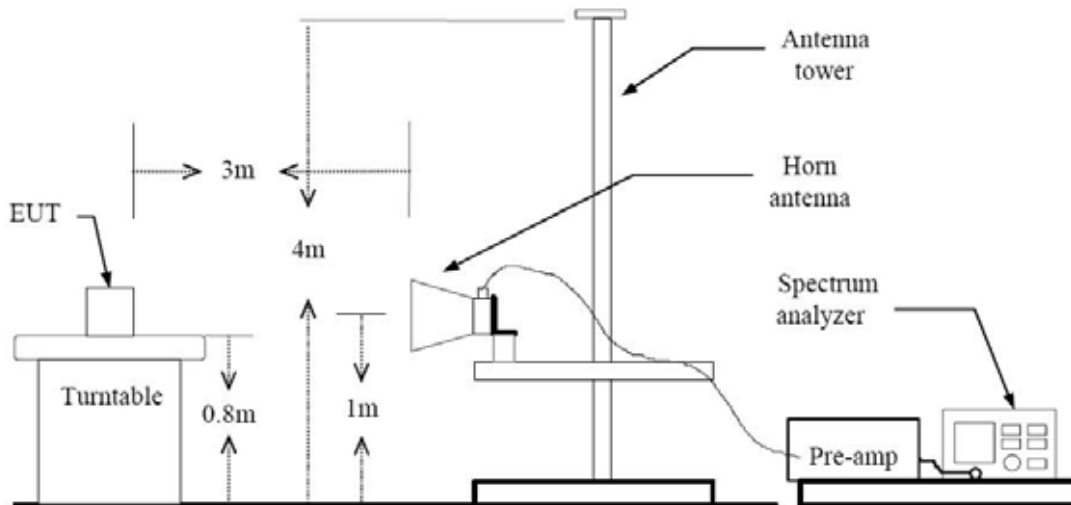


30 MHz - 1 GHz



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Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

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TEST RESULTS

9 kHz – 30MHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V	dB /m	dB	(H/V)	dB μ V/m	dB μ V/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 9 kHz to the 30MHz.
2. The reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
3. Distance extrapolation factor = 40 log (specific distance / test distance) (dB)
4. Limit line = specific Limits (dBuV) + Distance extrapolation factor
5. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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TEST RESULTS

Below 1 GHz

Operation Mode: Normal Mode

Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dB μ V	dB /m	dB	(H/V)	dB μ V/m	dB μ V/m	dB
No Critical peaks found							

Notes:

1. Measuring frequencies from 30 MHz to the 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Quasi peak detector mode.
3. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Above 1 GHz

Operation Mode:	802.11 b
Transfer Rate:	1 Mbps
Operating Frequency	2412
Channel No.	01 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4824	53.21	-0.79	V	52.42	74	21.58	PK
4824	43.64	-0.79	V	42.85	54	11.15	AV
7236	48.90	9.08	V	57.98	74	16.02	PK
7236	35.87	9.08	V	44.95	54	9.05	AV
4824	54.29	-0.79	H	53.5	74	20.50	PK
4824	46.82	-0.79	H	46.03	54	7.97	AV
7236	49.64	9.08	H	58.72	74	15.28	PK
7236	35.83	9.08	H	44.91	54	9.09	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
 - a. Peak (Procedure 4.2.3.2.2 in ANSI 63.10)
 - RBW = 1 MHz
 - VBW = 3 MHz
 - Detector = Peak
 - Trace = Max hold
 - Sweep = auto couple
 - b. Average (Procedure 4.2.3.2.3 in ANSI 63.10)
 - RBW = 1 MH
 - VBW = 10 Hz

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Span = Zero

Detector Mode = Peak

Trace = Max hold

6. We have done 802.11b/g/n(2.4 GHz) mode test. Worst case of EUT is 1 Mbps in 802.11b.

7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Operation Mode: 802.11 b
 Transfer Rate: 1 Mbps
 Operating Frequency: 2437
 Channel No. 06 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4874	52.74	-0.37	V	52.37	74	21.63	PK
4874	42.56	-0.37	V	42.19	54	11.81	AV
7311	49.50	8.64	V	58.14	74	15.86	PK
7311	35.37	8.64	V	44.01	54	9.99	AV
4874	54.12	-0.37	H	53.75	74	20.25	PK
4874	45.82	-0.37	H	45.45	54	8.55	AV
7311	49.66	8.64	H	58.30	74	15.70	PK
7311	35.49	8.64	H	44.13	54	9.87	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
 - a. Peak (Procedure 4.2.3.2.2 in ANSI 63.10)
 - RBW = 1 MHz
 - VBW = 3 MHz
 - Detector = Peak
 - Trace = Max hold
 - Sweep = auto couple
 - b. Average (Procedure 4.2.3.2.3 in ANSI 63.10)
 - RBW = 1 MH
 - VBW = 10 Hz
 - Span = Zero

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Detector Mode = Peak

Trace = Max hold

6. We have done 802.11b/g/n(2.4 GHz) mode test. Worst case of EUT is 1 Mbps in 802.11b.

7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Operation Mode: 802.11 b
 Transfer Rate: 1 Mbps
 Operating Frequency: 2462
 Channel No. 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-AMP G [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
4924	51.97	-0.15	V	51.82	74	22.18	PK
4924	41.75	-0.15	V	41.60	54	12.40	AV
7386	49.23	9.06	V	58.29	74	15.71	PK
7386	35.47	9.06	V	44.53	54	9.47	AV
4924	53.32	-0.15	H	53.17	74	20.83	PK
4924	44.65	-0.15	H	44.5	54	9.50	AV
7386	49.66	9.06	H	58.72	74	15.28	PK
7386	35.64	9.06	H	44.7	54	9.30	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
 - a. Peak (Procedure 4.2.3.2.2 in ANSI 63.10)
 - RBW = 1 MHz
 - VBW = 3 MHz
 - Detector = Peak
 - Trace = Max hold
 - Sweep = auto couple
 - b. Average (Procedure 4.2.3.2.3 in ANSI 63.10)
 - RBW = 1 MH
 - VBW = 10 Hz
 - Span = Zero

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Detector Mode = Peak

Trace = Max hold

6. We have done 802.11b/g/n(2.4 GHz) mode test. Worst case of EUT is 1 Mbps in 802.11b.

7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5745 MHz
Channel No.	149 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11490	44.48	11.22	V	55.70	74	18.30	PK
11490	29.81	11.22	V	41.03	54	12.97	AV
17235	46.11	18.82	V	64.93	74	9.07	PK
17235	31.00	18.82	V	49.82	54	4.18	AV
11490	43.68	11.22	H	54.90	74	19.10	PK
11490	29.65	11.22	H	40.87	54	13.13	AV
17235	45.05	18.82	H	63.87	74	10.13	PK
17235	31.05	18.82	H	49.87	54	4.13	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
 - a. Peak (Procedure 4.2.3.2.2 in ANSI 63.10)
 - RBW = 1 MHz
 - VBW = 3 MHz
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 - Trace = Max hold
 - Sweep = auto couple
 - b. Average (Procedure 4.2.3.2.3 in ANSI 63.10)
 - RBW = 1 MH
 - VBW = 10 Hz

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Span = Zero

Detector Mode = Peak

Trace = Max hold

6. We have done 802.11a/n_20 MHz BW(5.8 GHz) mode test. Worst case of EUT is 6 Mbps in 802.11a_5.8 GHz.

7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

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Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5785 MHz
Channel No.	157 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11570	43.77	11.71	V	55.48	74	18.52	PK
11570	29.03	11.71	V	40.74	54	13.26	AV
17355	44.72	18.94	V	63.66	74	10.35	PK
17355	31.22	18.94	V	50.16	54	3.85	AV
11570	42.73	11.71	H	54.44	74	19.56	PK
11570	28.94	11.71	H	40.65	54	13.35	AV
17355	46.02	18.94	H	64.96	74	9.05	PK
17355	31.27	18.94	H	50.21	54	3.80	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
 - a. Peak (Procedure 4.2.3.2.2 in ANSI 63.10)
 - RBW = 1 MHz
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 - Trace = Max hold
 - Sweep = auto couple
 - b. Average (Procedure 4.2.3.2.3 in ANSI 63.10)
 - RBW = 1 MH
 - VBW = 10 Hz

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
Test Report No. HCTR1303FR10	Date of Issue: March 06, 2013	EUT Type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC	FCC ID: ZNFUS780



Span = Zero

Detector Mode = Peak

Trace = Max hold

6. We have done 802.11a/n_20 MHz BW(5.8 GHz) mode test. Worst case of EUT is 6 Mbps in 802.11a_5.8 GHz.

7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
Test Report No. HCTR1303FR10	Date of Issue: March 06, 2013	EUT Type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC	FCC ID: ZNFUS780



Band :	5.8 GHz
Operation Mode:	802.11 a
Transfer Rate:	6 Mbps
Operating Frequency	5825 MHz
Channel No.	165 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11650	42.98	11.34	V	54.32	74	19.68	PK
11650	28.89	11.34	V	40.23	54	13.77	AV
17475	45.11	19.52	V	64.63	74	9.37	PK
17475	30.89	19.52	V	50.41	54	3.59	AV
11650	42.33	11.34	H	53.67	74	20.33	PK
11650	28.38	11.34	H	39.72	54	14.28	AV
17475	45.25	19.52	H	64.77	74	9.23	PK
17475	30.93	19.52	H	50.45	54	3.55	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
 - a. Peak (Procedure 4.2.3.2.2 in ANSI 63.10)
 - RBW = 1 MHz
 - VBW = 3 MHz
 - Detector = Peak
 - Trace = Max hold
 - Sweep = auto couple
 - b. Average (Procedure 4.2.3.2.3 in ANSI 63.10)
 - RBW = 1 MH
 - VBW = 10 Hz

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
Test Report No. HCTR1303FR10	Date of Issue: March 06, 2013	EUT Type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC	FCC ID: ZNFUS780



Span = Zero

Detector Mode = Peak

Trace = Max hold

6. We have done 802.11a/n_20 MHz BW(5.8 GHz) mode test. Worst case of EUT is 6 Mbps in 802.11a_5.8 GHz.

7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
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Band :	5.8 GHz
Operation Mode:	802.11 n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5755 MHz
Channel No.	151 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11510	42.14	11.53	V	53.67	74	20.33	PK
11510	28.27	11.53	V	39.80	54	14.20	AV
17265	45.05	18.46	V	63.51	74	10.49	PK
17265	31.58	18.46	V	50.04	54	3.96	AV
11510	42.39	11.53	H	53.92	74	20.08	PK
11510	28.49	11.53	H	40.02	54	13.98	AV
17265	45.24	18.46	H	63.70	74	10.30	PK
17265	31.59	18.46	H	50.05	54	3.95	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
 - a. Peak (Procedure 4.2.3.2.2 in ANSI 63.10)
 - RBW = 1 MHz
 - VBW = 3 MHz
 - Detector = Peak
 - Trace = Max hold
 - Sweep = auto couple
 - b. Average (Procedure 4.2.3.2.3 in ANSI 63.10)
 - RBW = 1 MH
 - VBW = 10 Hz

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
Test Report No. HCTR1303FR10	Date of Issue: March 06, 2013	EUT Type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC	FCC ID: ZNFUS780



Span = Zero

Detector Mode = Peak

Trace = Max hold

- 6. We have done test all data rate in 802.11n_40 MHz BW(5.8 GHz) mode. Worst case of EUT is 13.5 Mbps in 802.11n_40 MHz BW(5.8 GHz).
- 7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
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Band :	5.8 GHz
Operation Mode:	802.11 n_40 MHz BW
Transfer Rate:	13.5 Mbps
Operating Frequency	5795 MHz
Channel No.	159 Ch

Frequency [MHz]	Reading dBuV	AN.+CL-Amp G. [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
11590	41.16	11.64	V	52.80	74	21.20	PK
11590	27.41	11.64	V	39.05	54	14.95	AV
17385	44.96	18.91	V	63.87	74	10.14	PK
17385	31.12	18.91	V	50.03	54	3.97	AV
11590	42.23	11.64	H	53.87	74	20.13	PK
11590	27.37	11.64	H	39.01	54	14.99	AV
17385	44.48	18.91	H	63.39	74	10.62	PK
17385	31.15	18.91	H	50.06	54	3.95	AV

Notes:

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. Total = Reading Value + Antenna Factor + Cable Loss - Amp Gain
5. Spectrum setting:
 - a. Peak (Procedure 4.2.3.2.2 in ANSI 63.10)
 - RBW = 1 MHz
 - VBW = 3 MHz
 - Detector = Peak
 - Trace = Max hold
 - Sweep = auto couple
 - b. Average (Procedure 4.2.3.2.3 in ANSI 63.10)
 - RBW = 1 MH
 - VBW = 10 Hz

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
Test Report No. HCTR1303FR10	Date of Issue: March 06, 2013	EUT Type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC	FCC ID: ZNFUS780



Span = Zero

Detector Mode = Peak

Trace = Max hold

- 6. We have done test all data rate in 802.11n_40 MHz BW(5.8 GHz) mode. Worst case of EUT is 13.5 Mbps in 802.11n_40 MHz BW(5.8 GHz).
- 7. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
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8.1.2 RADIATED RESTRICTED BAND EDGE MEASUREMENTS

Test Requirements and limit, §15.247(d) §15.205, §15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a) (See section 15.205(c)).

Operation Mode:	802.11g
Transfer Rate:	6 Mbps
Operating Frequency	2412 MHz, 2462 MHz
Channel No.	01 Ch, 11 Ch

Frequency [MHz]	Reading dBuV	AN.+CL [dB]	ANT. POL [H/V]	Total [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Detect
2390.0	29.32	33.90	H	63.22	74	10.78	PK
2390.0	14.17	33.90	H	48.07	54	5.93	AV
2390.0	30.23	33.90	V	64.13	74	9.87	PK
2390.0	14.33	33.90	V	48.23	54	5.77	AV
2483.5	30.49	33.99	H	64.48	74	9.52	PK
2483.5	13.76	33.99	H	47.75	54	6.25	AV
2483.5	27.64	33.99	V	61.63	74	12.37	PK
2483.5	12.85	33.99	V	46.84	54	7.16	AV

Notes:

1. Total = Reading Value + Antenna Factor + Cable Loss
2. Spectrum setting:
 - a. Peak (Procedure 4.2.3.2.2 in ANSI 63.10)
 - RBW = 1 MHz
 - VBW = 3 MHz
 - Detector = Peak
 - Trace = Max hold
 - Sweep = auto couple
 - b. Average (Procedure 4.2.3.2.3 in ANSI 63.10)

FCC PT.15.247 TEST REPORT	FCC Class II Permissive Change REPORT		www.hct.co.kr
Test Report No. HCTR1303FR10	Date of Issue: March 06, 2013	EUT Type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC	FCC ID: ZNFUS780



RBW = 1 MH

VBW = 10 Hz

Span = Zero

Detector Mode = Peak

Trace = Max hold

3. We have done 802.11b/g/n mode test. . Worst case of EUT is 6 Mbps in 802.11g

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9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Interval	Calibration Due	Serial No.
Rohde & Schwarz	ENV216/ LISN	Annual	02/06/2014	100073
Schwarzbeck	VULB 9168/ TRILOG Antenna	Biennial	06/17/2013	255
Rohde & Schwarz	ESI 40 / EMI TEST RECEIVER	Annual	05/03/2013	831564103
Agilent	E4440A/ Spectrum Analyzer	Annual	05/02/2013	US45303008
Agilent	N9020A/ SIGNAL ANALYZER	Annual	05/21/2013	MY51110063
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	SCU-18/ Signal Conditioning Unit	Annual	09/11/2013	10094
MITEQ	AMF-6B-180265-35-10P / POWER AMP	Annual	04/16/2013	667624
CERNEX	CBL26405040 / POWER AMP	Annual	04/16/2013	19660
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	10/17/2013	937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	Biennial	10/30/2014	BBHA9170124
Rohde & Schwarz	FSP / Spectrum Analyzer	Annual	02/08/2014	839117/011
Agilent	E4416A /Power Meter	Annual	11/07/2013	GB41291412
Agilent	E9327A /POWER SENSOR	Annual	05/02/2013	MY4442009
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHF3.0/18G-10EF / High Pass Filter	Annual	02/08/2014	F6
Wainwright Instrument	WHNX6.0/26.5G-6SS / High Pass Filter	Annual	05/02/2013	1
Wainwright Instrument	WHNX7.0/18G-8SS / High Pass Filter	Annual	05/02/2013	29
Wainwright Instrument	WRCJ2400/2483.5-2370/2520-60/14SS / Band Reject Filter	Annual	05/02/2013	1
Hewlett Packard	11636B/Power Divider	Annual	11/07/2013	11377
Hewlett Packard	11667B / Power Splitter	Annual	06/05/2013	05001
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	11/07/2013	3110117
ITECH	IT6720 / DC POWER SUPPLY	Annual	11/07/2013	010002156287001199
TESCOM	TC-3000C / BLUETOOTH TESTER	Annual	11/07/2013	3000C000276
Rohde & Schwarz	CBT / BLUETOOTH TESTER	Annual	05/02/2013	100422
EMCO	6502.LOOP ANTENNA	Biennial	01/11/2014	9009-2536
MITEQ	AMF-6D-001180-35-20P/ POWER AMP	Annual	07/30/2013	990893
Agilent	8493C / Attenuator(10 dB)	Annual	07/30/2013	76649
WEINSCHL	2-3 / Attenuator(3 dB)	Annual	11/07/2013	BR0617

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